

# bottom/charm separation in semileptonic channel update

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What's new:

- proper normalization for all  $P_T$  ranges
- use of signed DCA
- yield vs  $P_T$  for large DCA cuts
- plot different DCA on the same plot

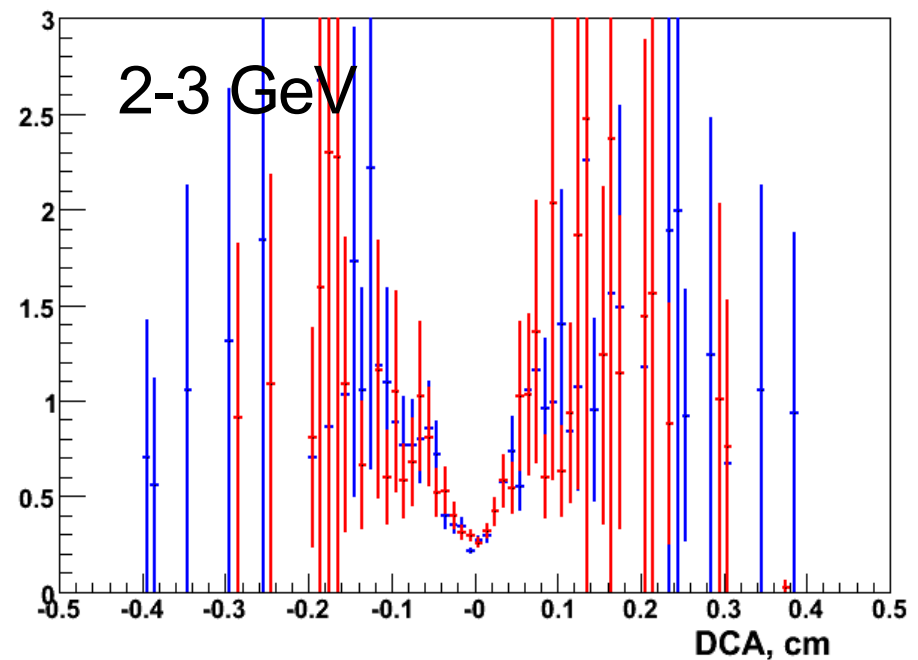
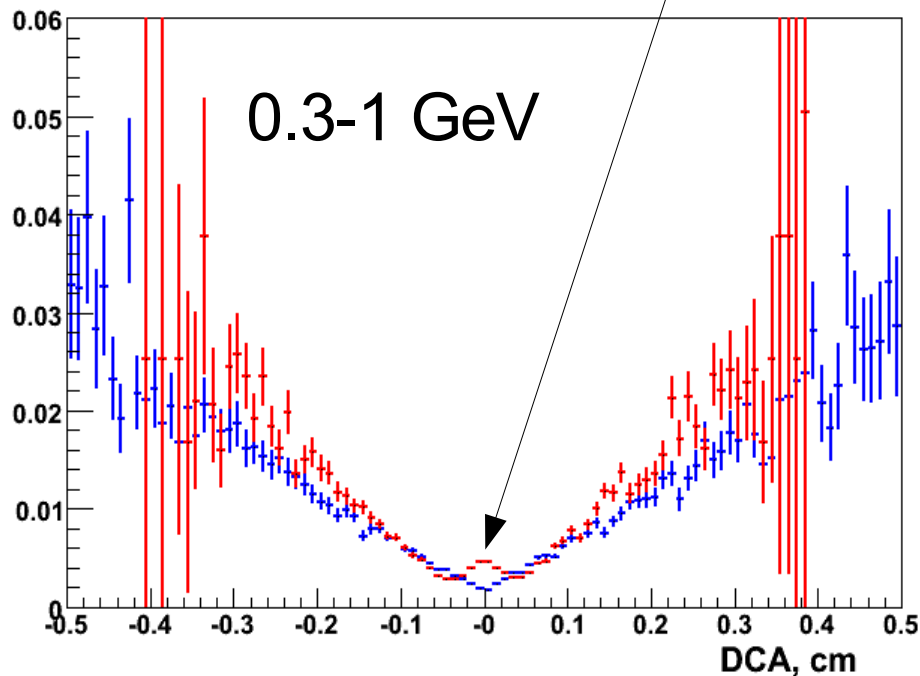
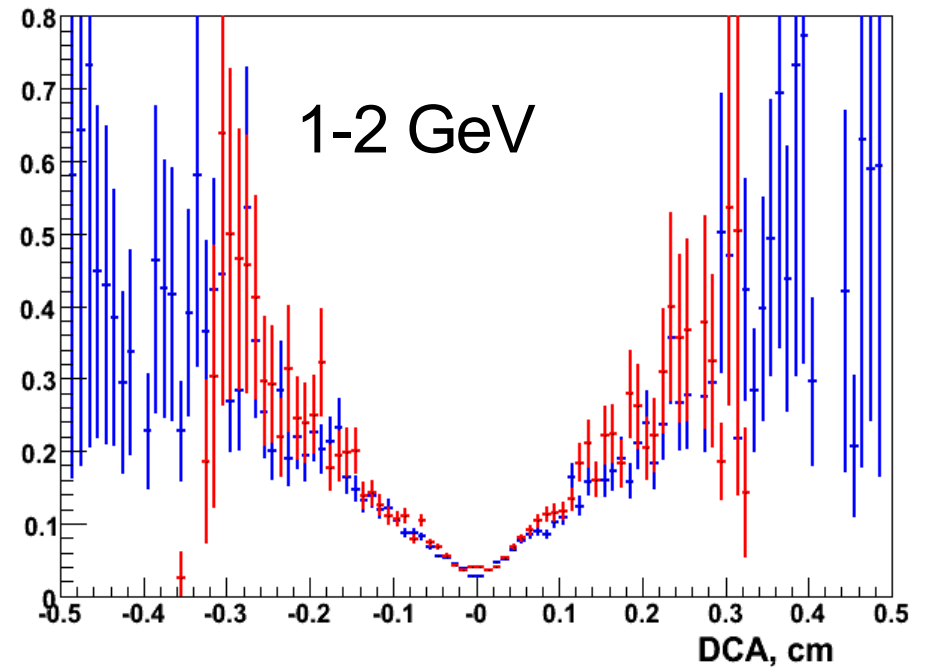
# Quick reminder

- Single D and B mesons from PYTHIA, decaying to electrons.
- $D^0$ ,  $D^+$ ,  $D^-$ , and  $B^0$ ,  $B^+$ , and  $B^-$  only were used.
- Two data sets:
  - $\text{ckin}(3)=0$ . (pythia default);
  - $\text{ckin}(3)=10$ . For study of high  $P_T$  range
- I'm showing 3 different DCAs:
  - true DCA calculated from MC info using straight line projections.
  - DCA calculated from 2 inner pixel layers using cgl cluster association and straight line projections.
  - KalFit DCA (uses Central Arm info)
- Full simulation and reconstruction
- All plots are properly normalized and correspond to  $\sim 1.7\text{B}$  min. bias pp events ( $\sim 1\%$  of run5pp)

# bottom/charm ratios vs DCA for SVX DCA

Blue: true DCA (from MC info)  
Red: DCA from SVX pixel layers

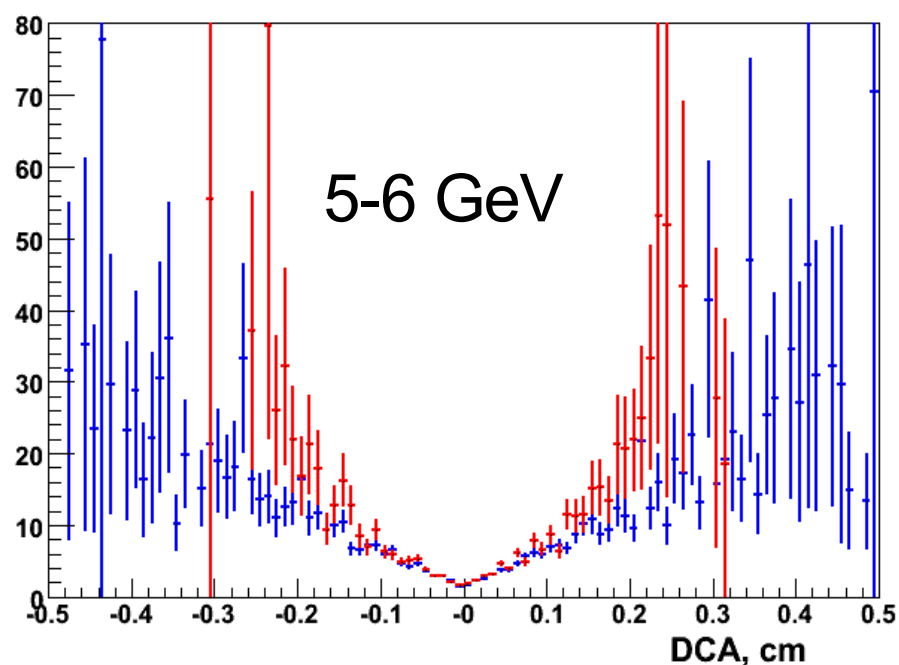
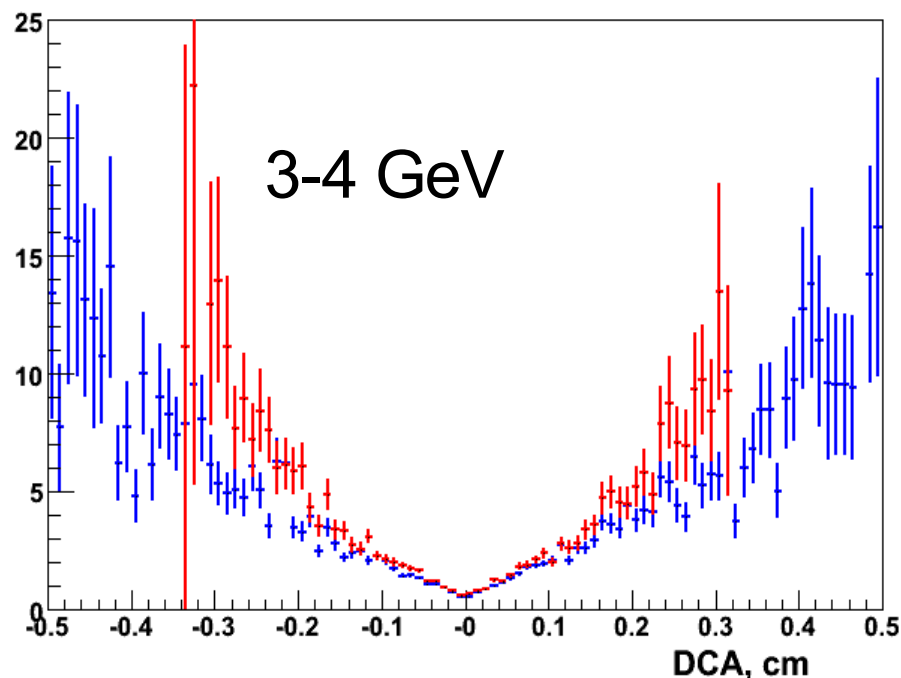
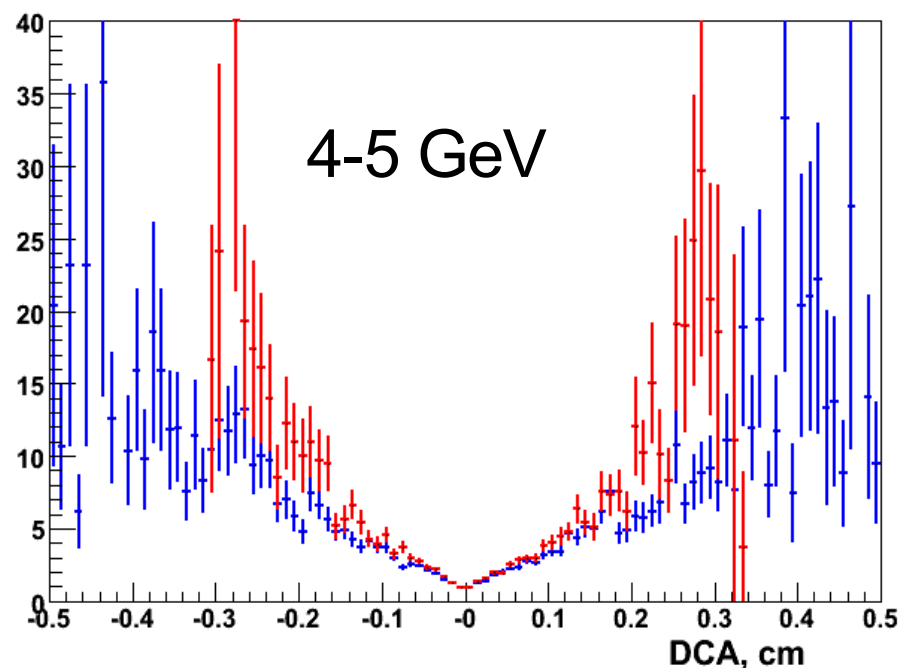
These are tracks with large DCA,  
but reconstructed close to 0 due  
to wrong association by cgl



# bottom/charm ratios vs DCA for SVX DCA (high $P_T$ )

Different simulated data sample,  
but normalization is still correct.

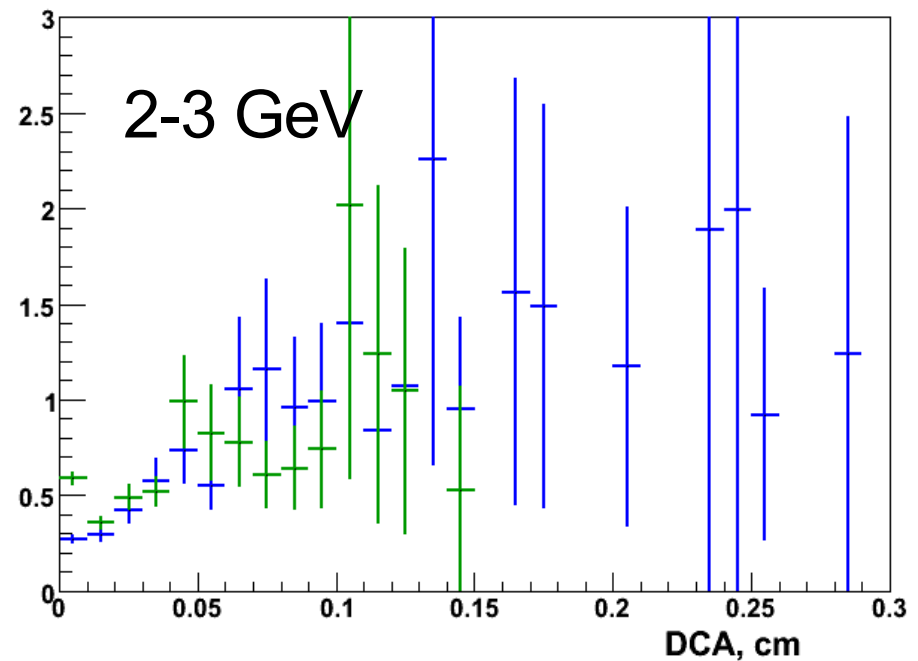
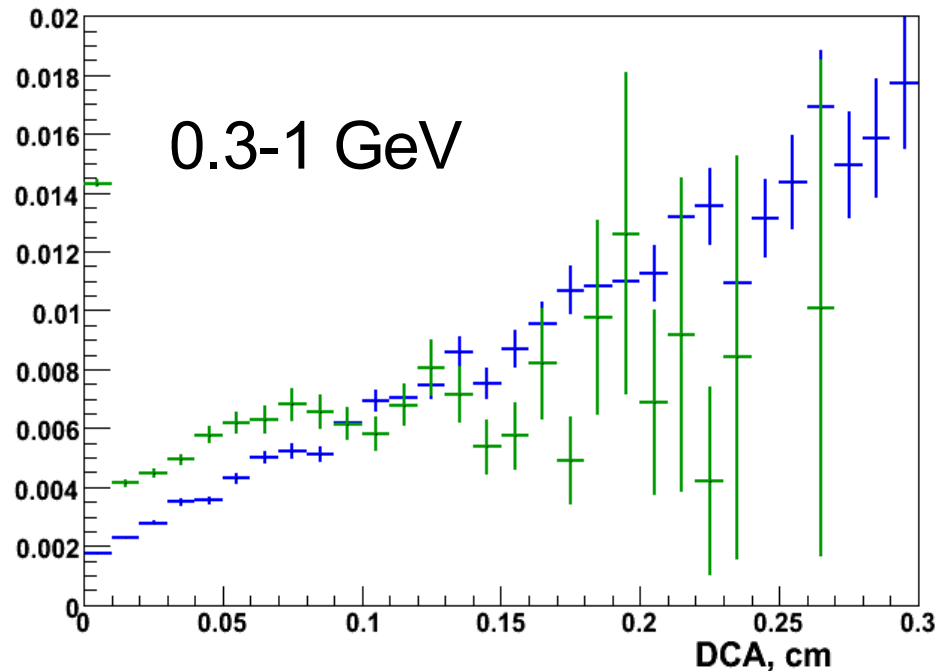
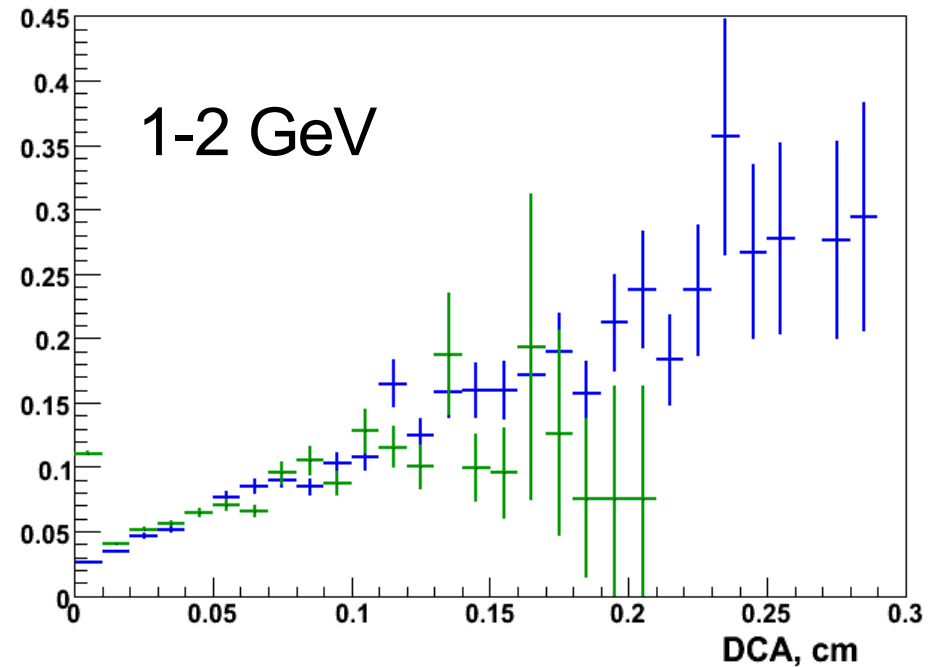
All plots correspond to  $\sim 1.7B$   
min. bias p+p events or  $\sim 1\%$   
of run5 p+p data.



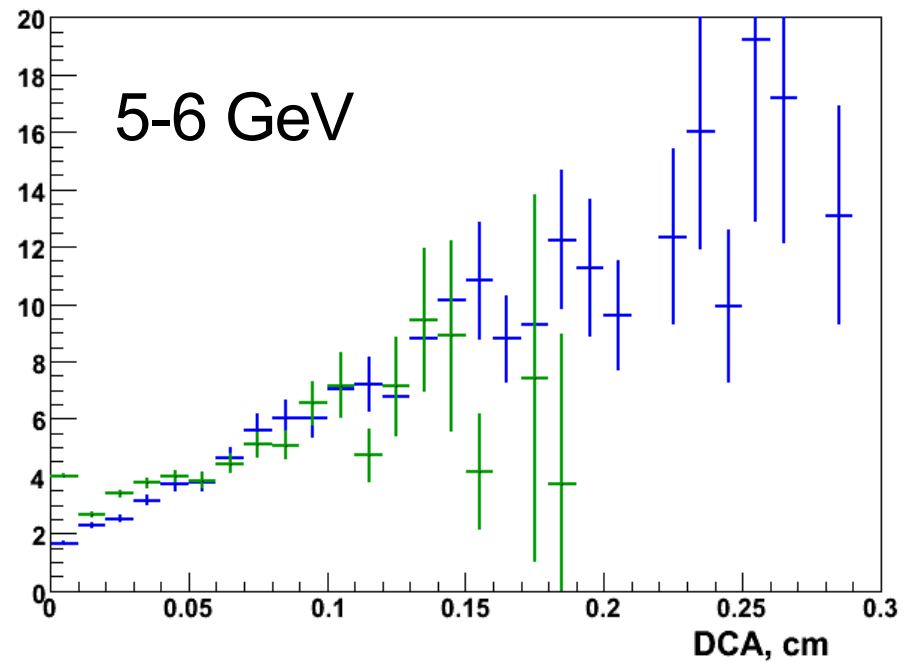
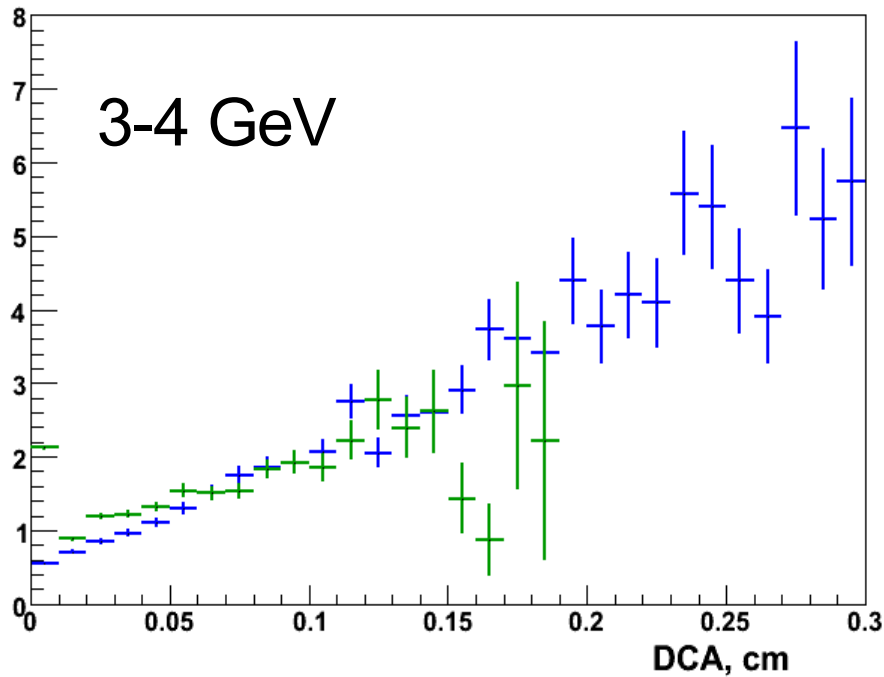
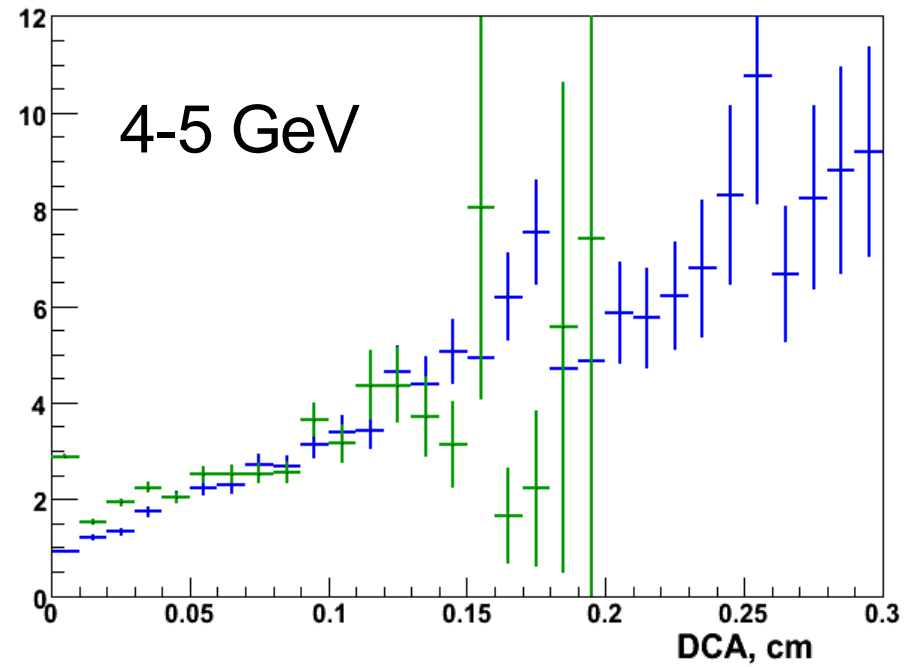
# b/c ratios vs DCA for KalFit DCA

Blue: true DCA from MC info  
Green: KalFit DCA

KalFit only gives absolute value of DCA.  
KalFit works worse at low  $P_T$

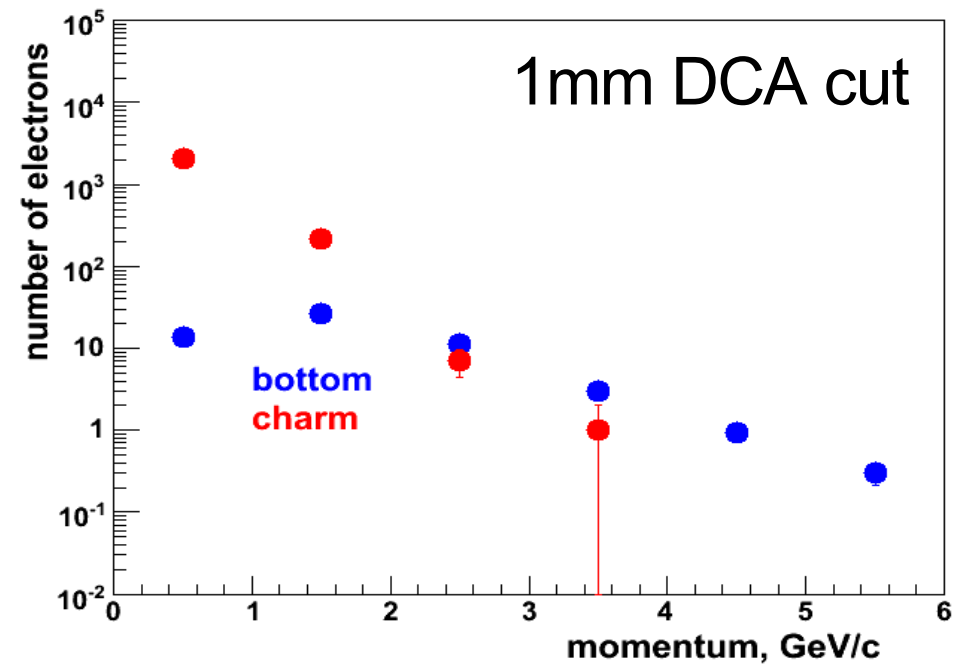
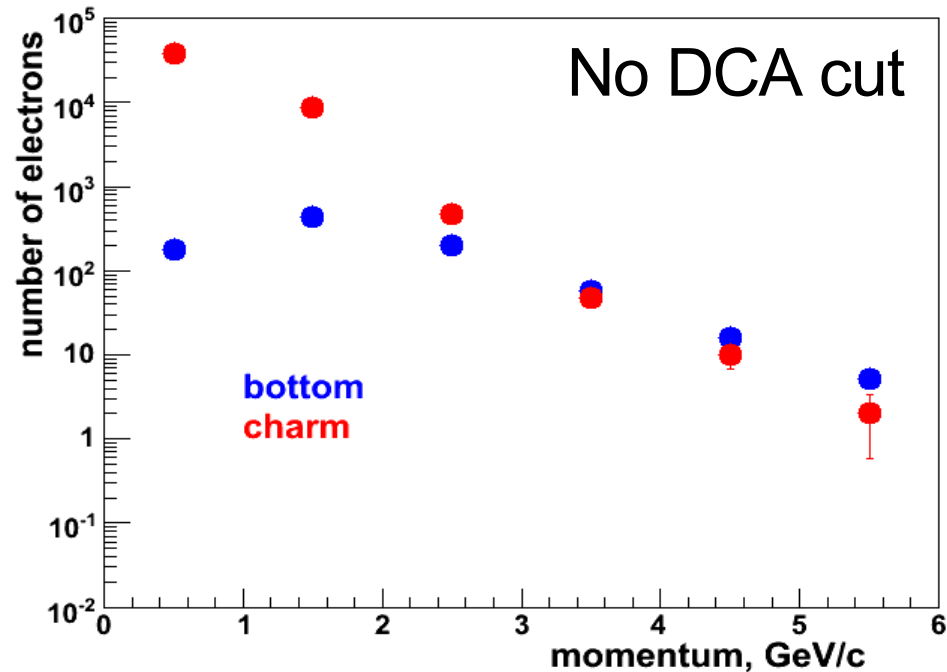
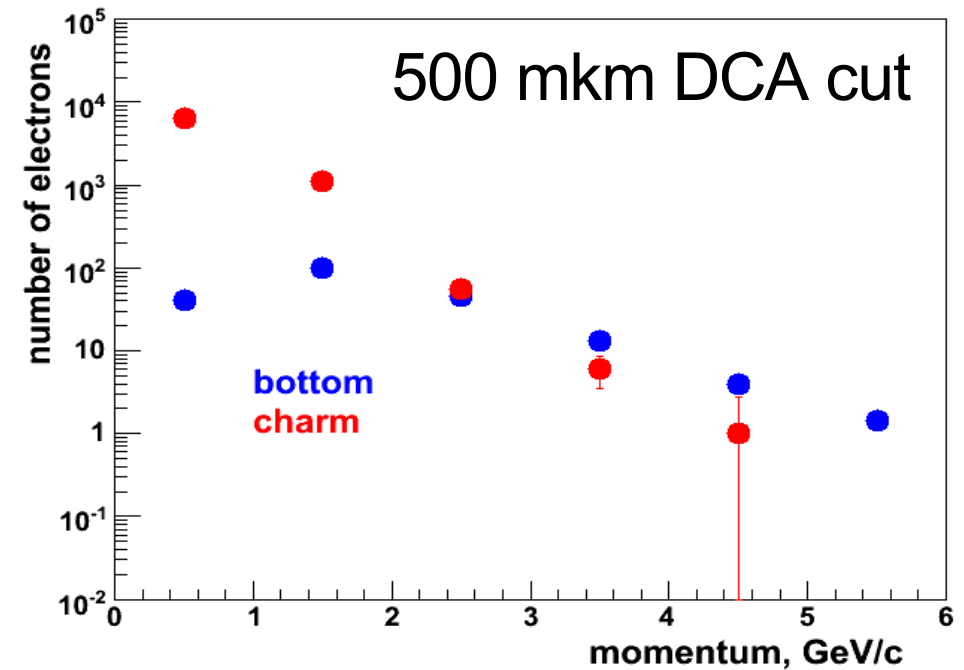


# b/c ratios vs DCA for KalFit DCA (high $P_T$ )



# Number of electrons vs $P_T$ for large DCA cuts

All plots correspond to  
~1.7B min. bias pp events  
or ~1% of run5 p+p.



# Closer look at higher $P_T$ range

Different simulated data sample (ckin(3)=10GeV).

